



IST and METIL Overview

UNIVERSITY OF CENTRAL FLORIDA

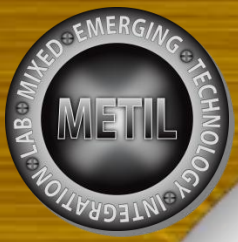


**INSTITUTE for
SIMULATION
& TRAINING**®

David Metcalf, Ph.D.



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Topics

- Background and UCF/IST Overview
- METIL Mission
 - Research Disciplines
 - Partners/Sponsors
 - Markets Impacted
- Select Projects
- Future Goals and Needs



The University of Central Florida



- Orlando, FL
- 3rd largest University in U.S.
- 2nd highest number of CS graduates
- 2009-10 enrollment exceeds 53,000 (8/30/09)
- 12 Colleges
- 68 degree programs

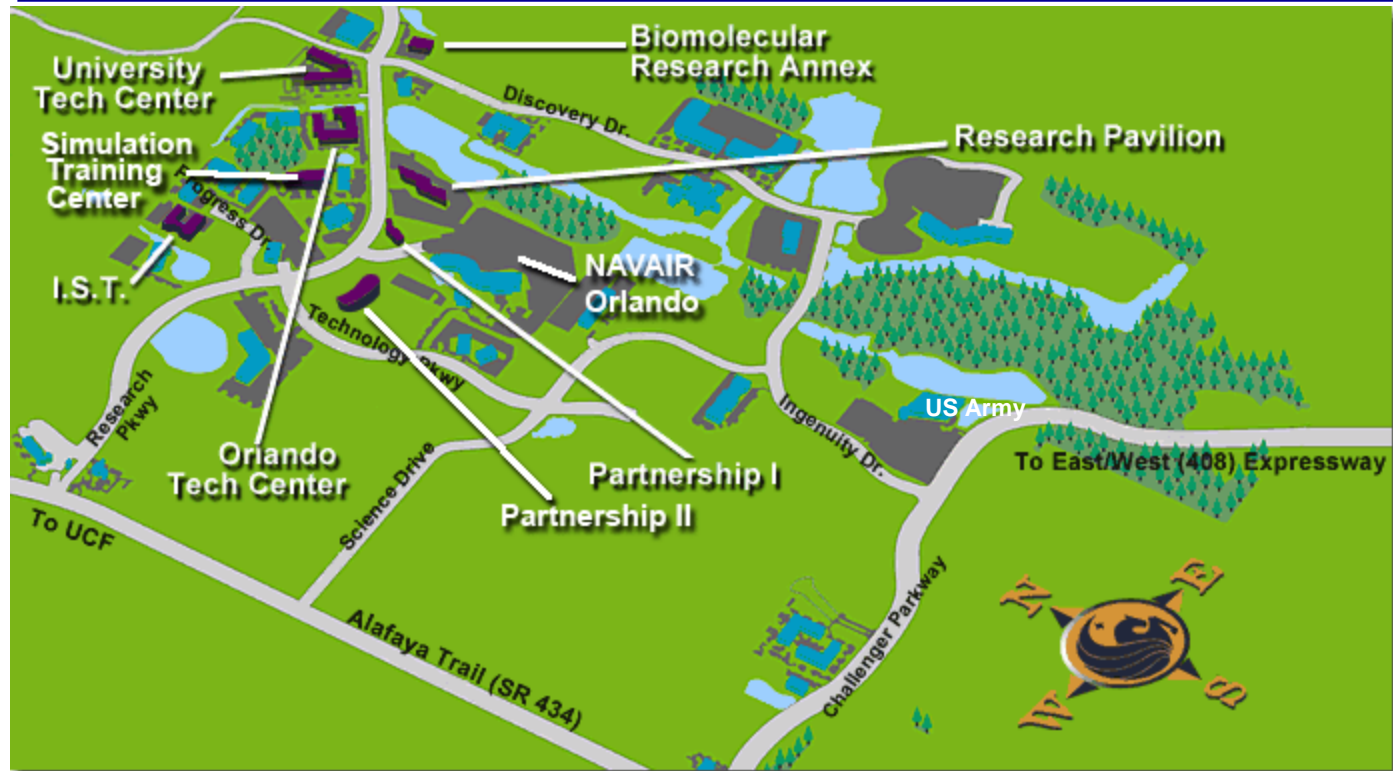
The Institute for Simulation and Training

is a Research Institute reporting to the Vice President for Research

Some Partners in the Community



Central Florida Research Park



Among the nation's top 10

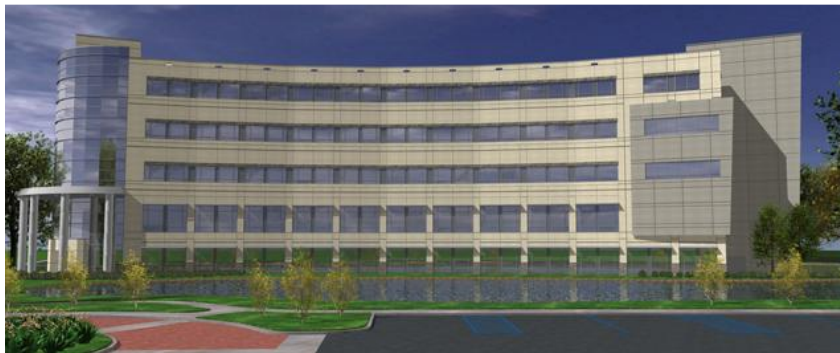
\$5.12 Billion in Training and Simulation flows through Central Florida with the Research Park the Hub

IST Vision

Be...

**the premier academic research organization
internationally recognized for**

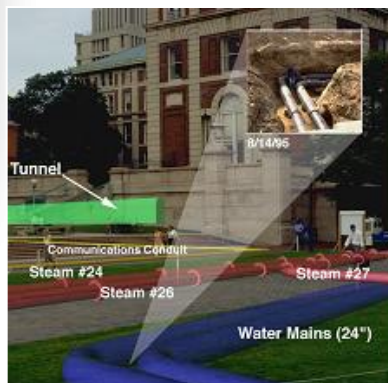
- **creative interdisciplinary contributions
to the art and science of human-centric
simulation.**



Institute for Simulation & Training

Capabilities

Multi-Resolution Simulation
High-Level Architecture
Connectivity
Computer Generated Forces
Virtual Environments
Computer Graphics
Terrain Databases
Low-Cost Graphics
Training & Education
New Simulation Environments
Medicine
Public Safety
Information Technology



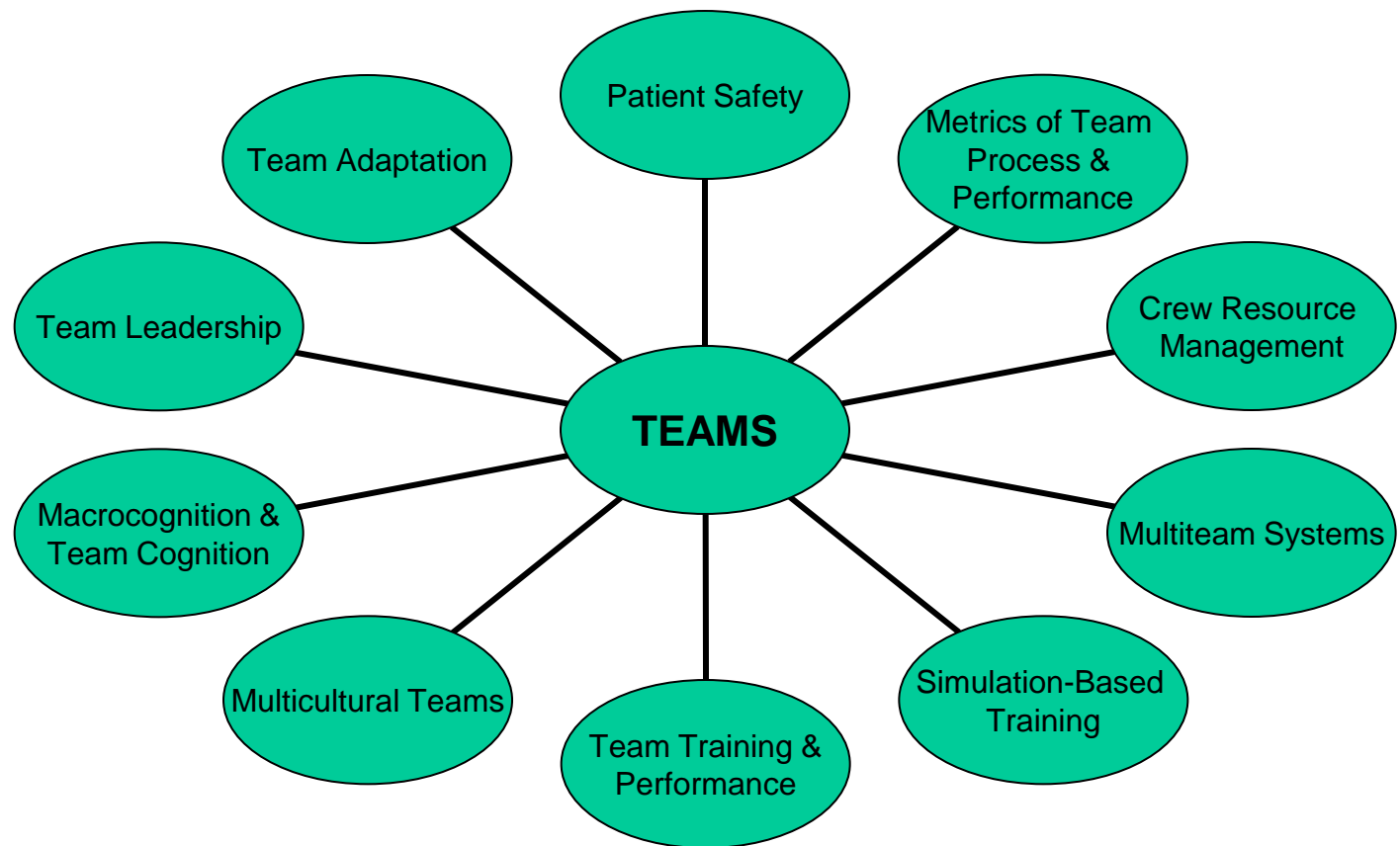


A Sampling of Current Research Programs & Laboratory Activities

Human Systems Integration Research

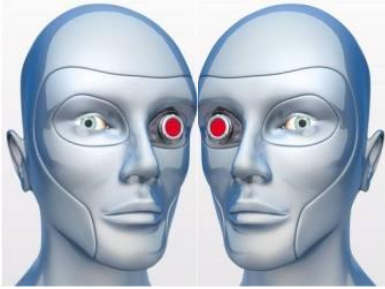
Maximizing human performance in complex environments through a team-centered approach to training, learning, and assessment.

Areas of Expertise



Cognitive Sciences Laboratory

Explores how elements internal and external to the mind are integrated, how they work and how cognitive systems can be improved. IST & Dept. of Philosophy collaboration.



Examine cognition and coordination in human-agent teams.

Funding: ARL

Partner: Computer Science



Develop cross-disciplinary theories to enhance research in team cognition and coordination.

Funding: ONR

Partner: Psychology

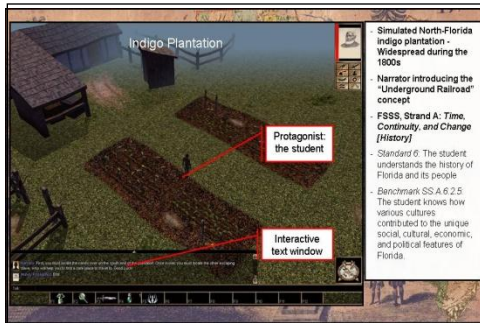


Improve training systems to accelerate the development of perceptual expertise for X-ray security screeners.

Funding: DHS

Partner: Psychology

Cognitive Science examines such phenomena by drawing on a variety of disciplines, including psychology, computer science, philosophy, neuroscience, modeling and simulation, linguistics and anthropology.



Develop games to augment humanities education.

Funding: UCF

Partner: Digital Media



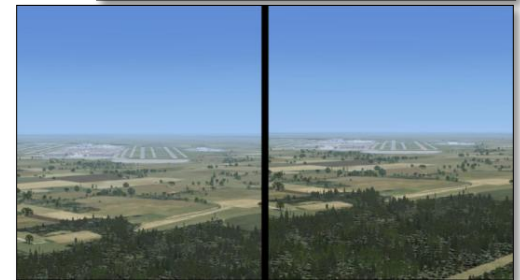
Examine how simulation tools may improve understanding in environmental economics.

Funding: NSF

Partner: Economics and Computer Science

Team Performance Laboratory

- ◆ Director: Florian Jentsch, Ph.D.
- ◆ Mission: to develop and test theory and methods from the psychological, organizational, and computational sciences in the study of individual and team process and performance.
- ◆ Current research projects
 - **DHS Transportation Security Laboratory (TSL)**
 - X-Ray baggage screening training (cues, trng env., field studies)
 - **Federal Aviation Administration (FAA)**
 - Aviation training research (scenario gen & knowledge assessment tools for various avn events)
 - **Army Research Laboratory (ARL) and RDECOM**
 - Human-Agent Team research (route planning, target detection using scale MOUT facility & virtual foxhole)



RETRO Laboratory



Route Planner Minigame
Funded by: The Robert Wood Johnson Foundation



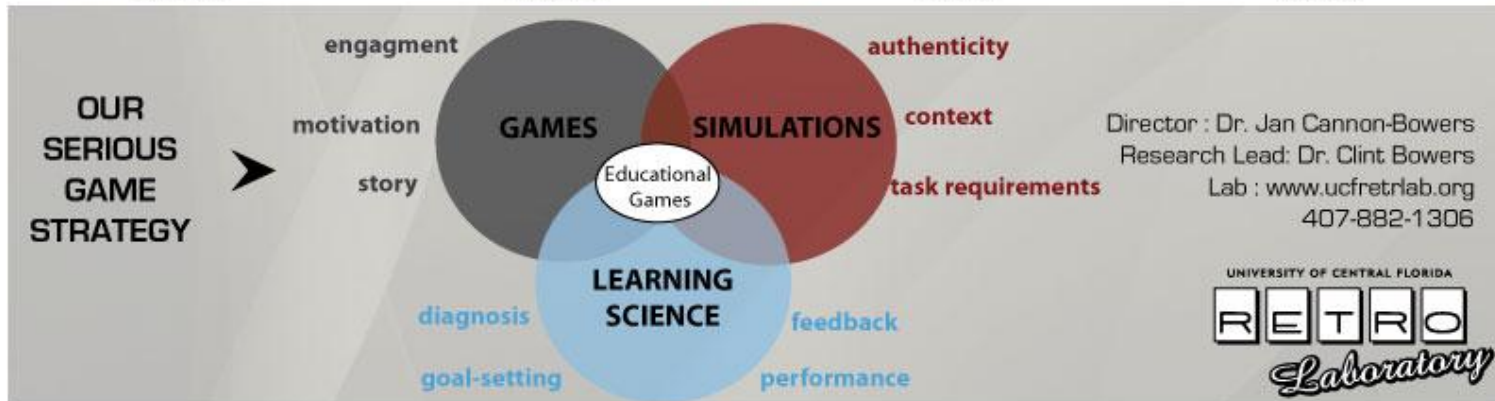
Clean House Minigame
Funded by: The Robert Wood Johnson Foundation



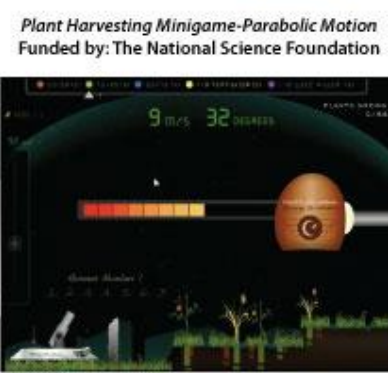
Flood Control Sim Cinematic
Funded by: The Office of Naval Research



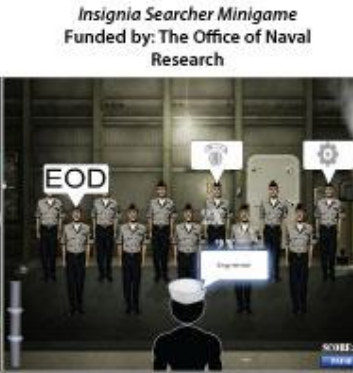
Testing @ NSTC Great Lakes, IL
Funded by: The Office of Naval Research



Lunar Quest MMOG
Funded by: The National Science Foundation



Plant Harvesting Minigame-Parabolic Motion
Funded by: The National Science Foundation



Insignia Searcher Minigame
Funded by: The Office of Naval Research



Lunar Quest MMOG In-Game Play
Funded by: The National Science Foundation

Current Research on Stokes

IST

- ◆ Investigating strategies for Mapping MMOG onto Stokes.
- ◆ Crowd Modeling and Semi-automated Force (SAF).
- ◆ Computational Steering and Visualization.

Civil Engineering

- ◆ Coastal Modeling to bBetter Predict Tidal Conditions.

Physics

- ◆ Theoretical and Computational Modeling of Materials.

Nanoscience

- ◆ Computer-assisted Design of Non-linear Optical Materials with Applications Including Three Dimensional Data Storage.

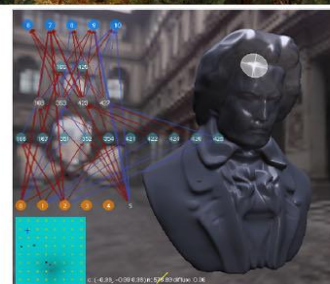


Future M&S Research

- ◆ New M&S Computing Arch.
- ◆ Augmented Cognition
- ◆ M&S Interoperability

Approaches

Mixed Reality Facility



Cognitive Rehabilitation Experiment



ACTIVE* Laboratory



**Applied Cognition and Training in Immersive Virtual Environments*

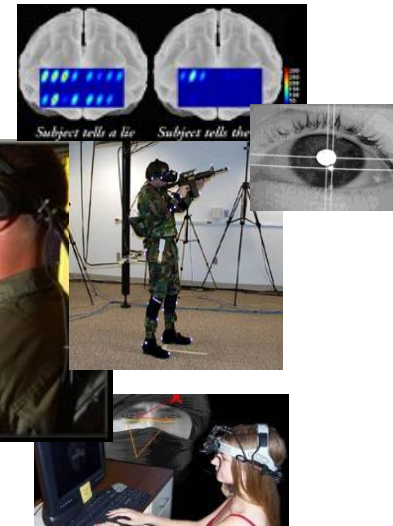
The **ACTIVE Lab** engages in applied research and development for the analysis and improvement of human performance. Our multidisciplinary team of more than 30 researchers is organized into focus area teams:

- ❖ Simulation Based Learning
- ❖ Adaptive Interaction
- ❖ Operational Neurosensing
- ❖ Human Robotics Interaction
- ❖ Social Cultural Behavior Modeling

Provide Content &
Information to
Stimulate the Senses



Measure & Model
the human's "state"



Adapt processing &
interfaces based on
the human's "state"

**Merging virtual reality and neuroscience to advance
the state of the art in human training**

Mixed Emerging Technology Integration Lab (METIL)

Go for the Green

Mobile learning sales game with a golf theme on iPhone, Blackberry, Symbian and Windows Mobile



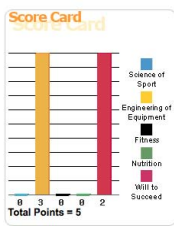
Mobile My Sports Pulse Challenge

Mobile Simulations for Science, Technology, Engineering and Math (STEM) Education



Title: Amateur
School:
Jersey #: 5100286

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Innovative integration of 3 domains:

STEM Education to improve students interest and future technical entrepreneurship opportunities

Sports Theme to expand audience, promote interest and provide extrinsic motivation

Mobile Technology for delivery to a young, broad audience, reaching millions internationally



Microsoft

Mobile SCORM-conforming courses

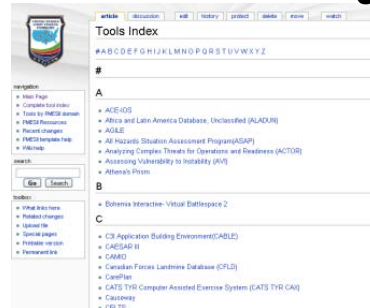


Learning, Knowledge & Cognition

Mobile

Games and Simulations
Virtual Worlds
Collaborative Technologies
Web 2.0 and beyond

PMESII Catalog



Community-editable database wiki for irregular warfare simulations



DAU Sim Cards

Classroom, Online, Mobile and Virtual World Learning Scenarios



Johnson & Johnson PRD 3D University



Corporate Mobile Learning, Virtual Worlds and KM/Collab



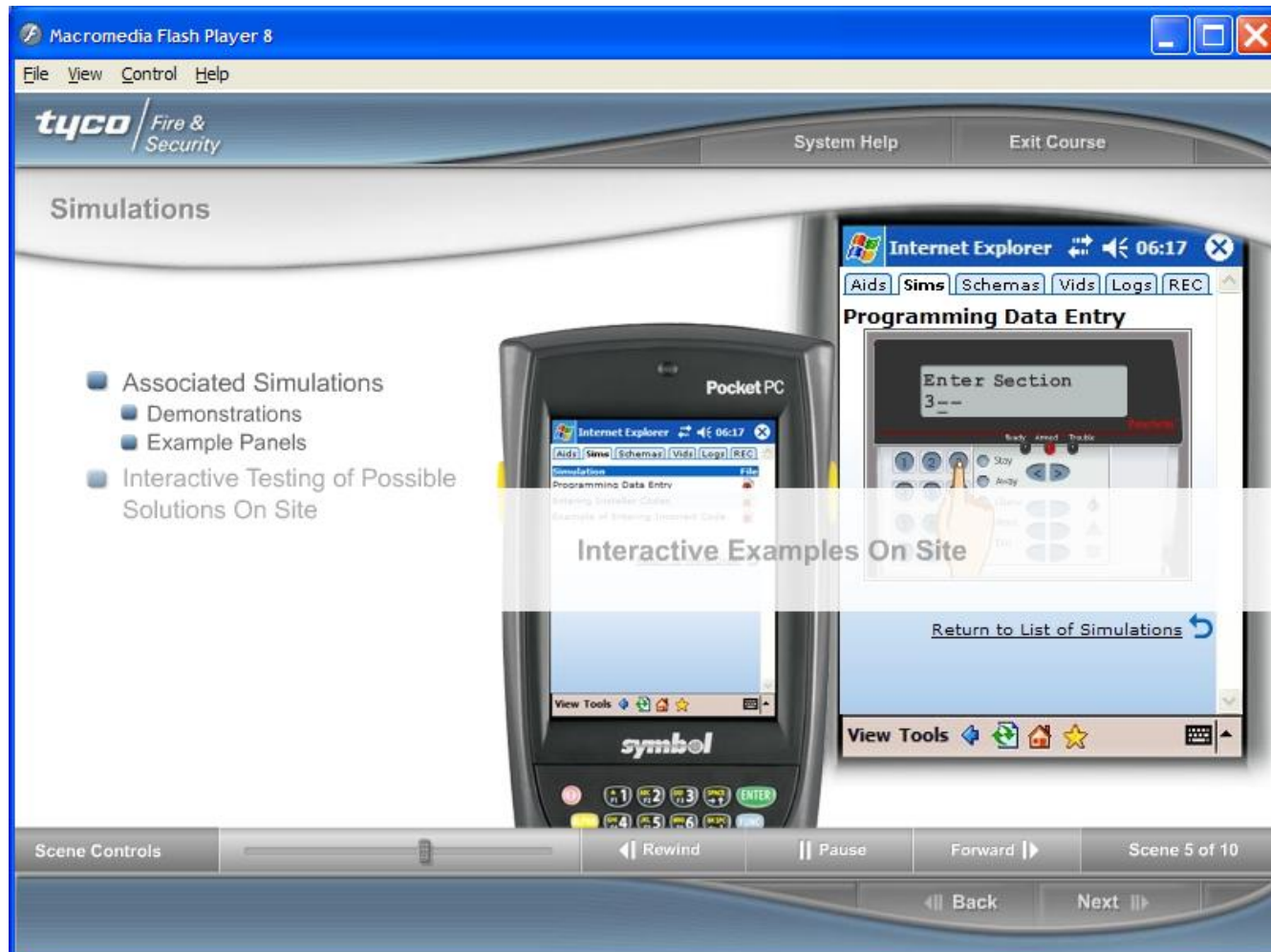


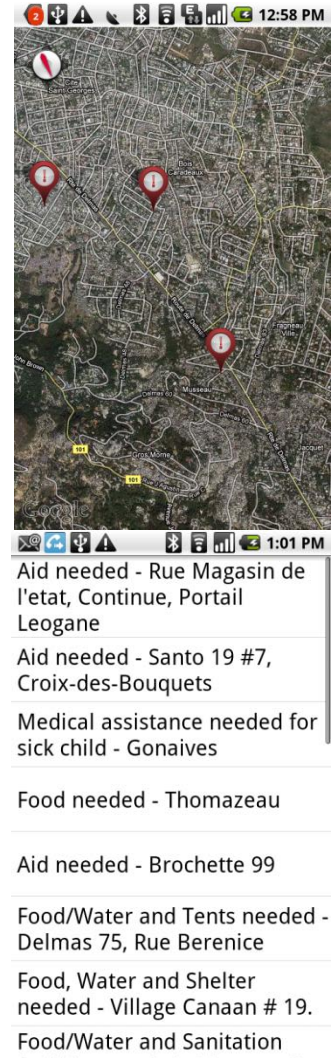
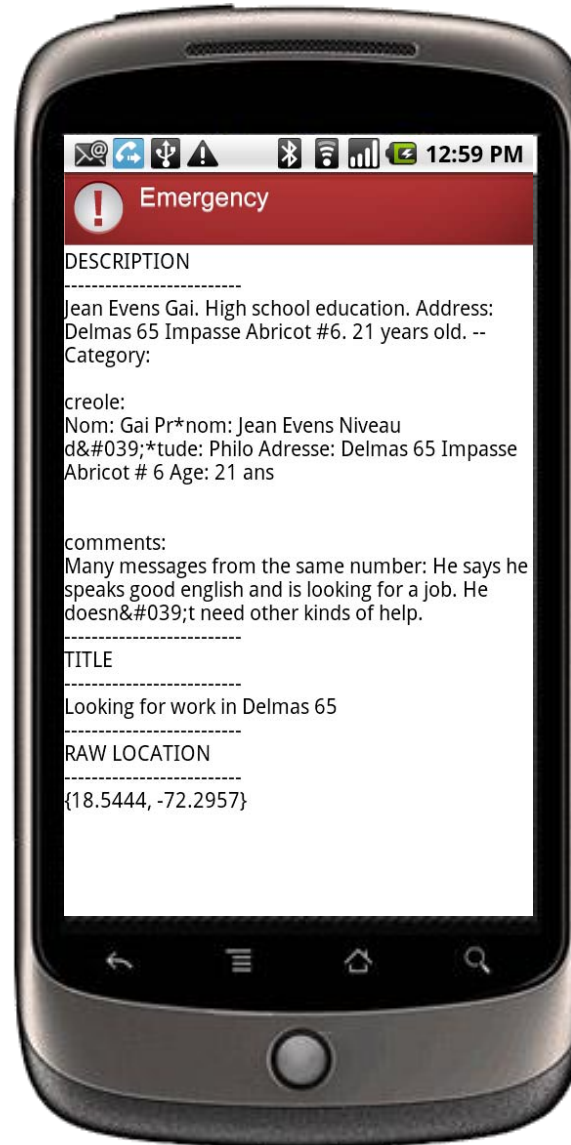
Example Projects



Tyco Phase IV

- Mobile Performance Support, over 5000 devices
- Audio Podcast access
- Blackberry Pilot

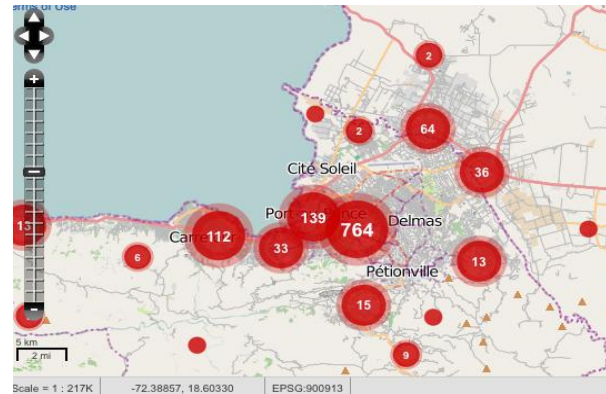




ONR request and NSF assessment funding

Haiti and Kenya

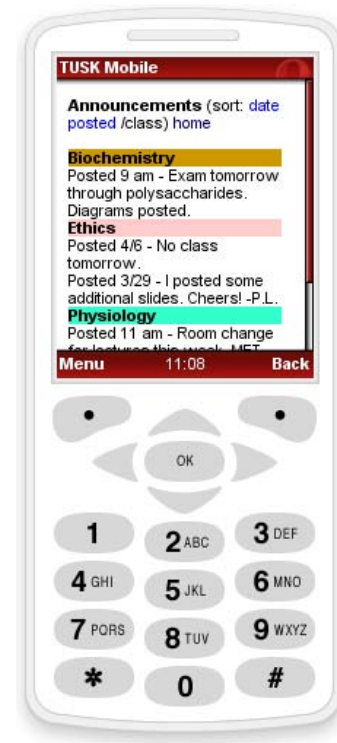
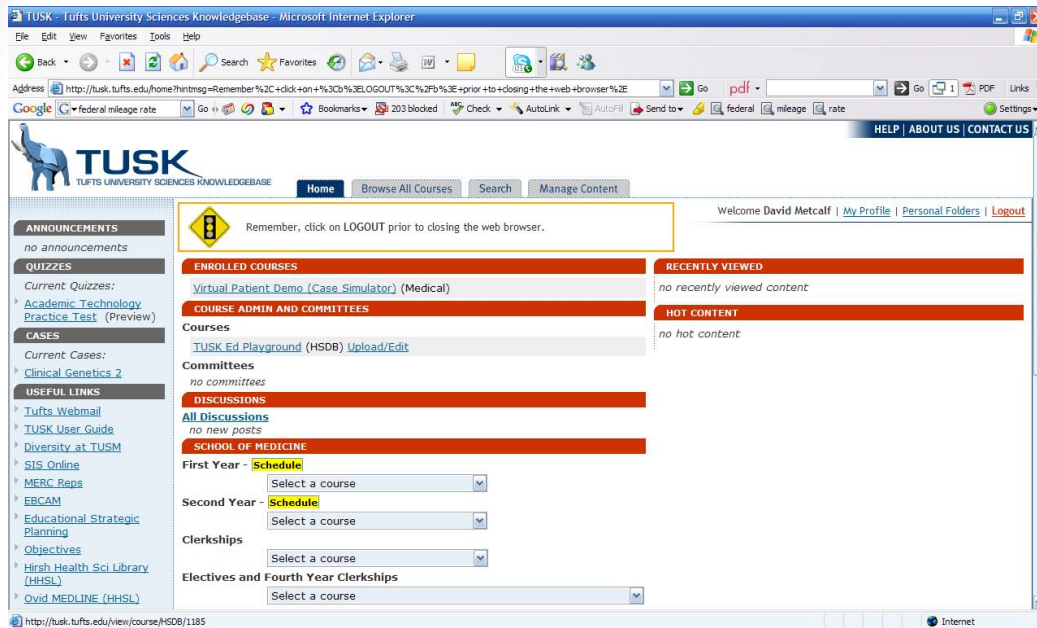
- Mobile Aid Tracker for Android, supplies and Combat medic trainer cards being deployed

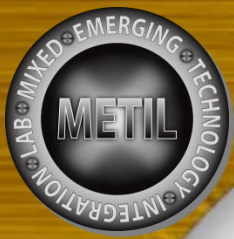


- Raytheon sponsored project for mobile banking, healthcare and education in Kenya Summer 2010

Tufts University

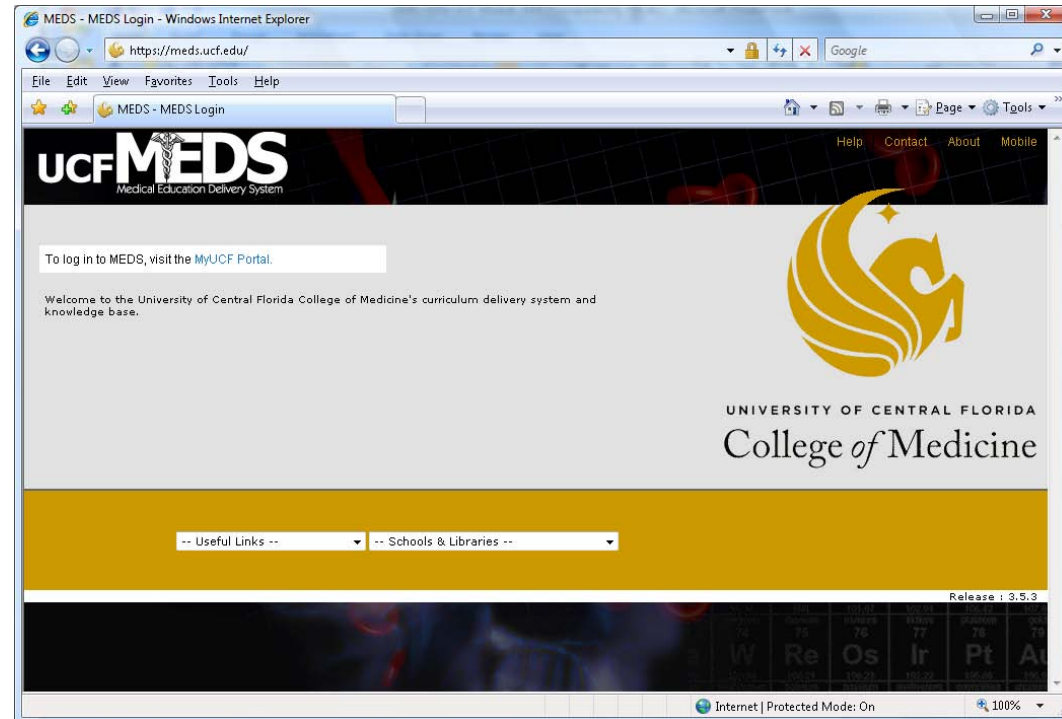
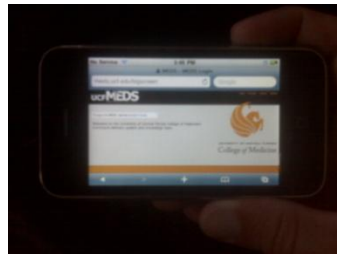
- Mobile access to TUSK, Tufts University Science Knowledgebase in developing nations of East Africa and India

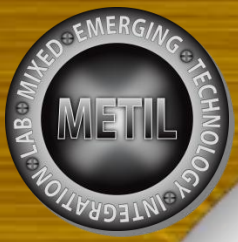




UCF College of Medicine

- IT, Simulation and Mobile integration and development for 2009 launch



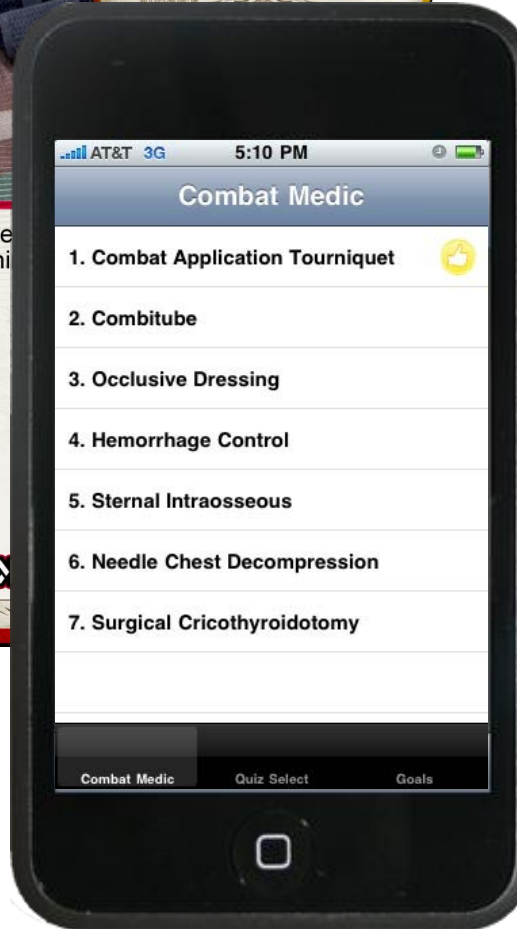
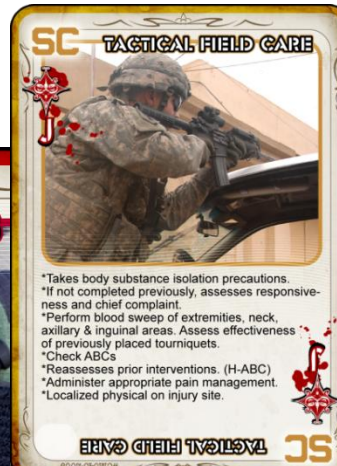


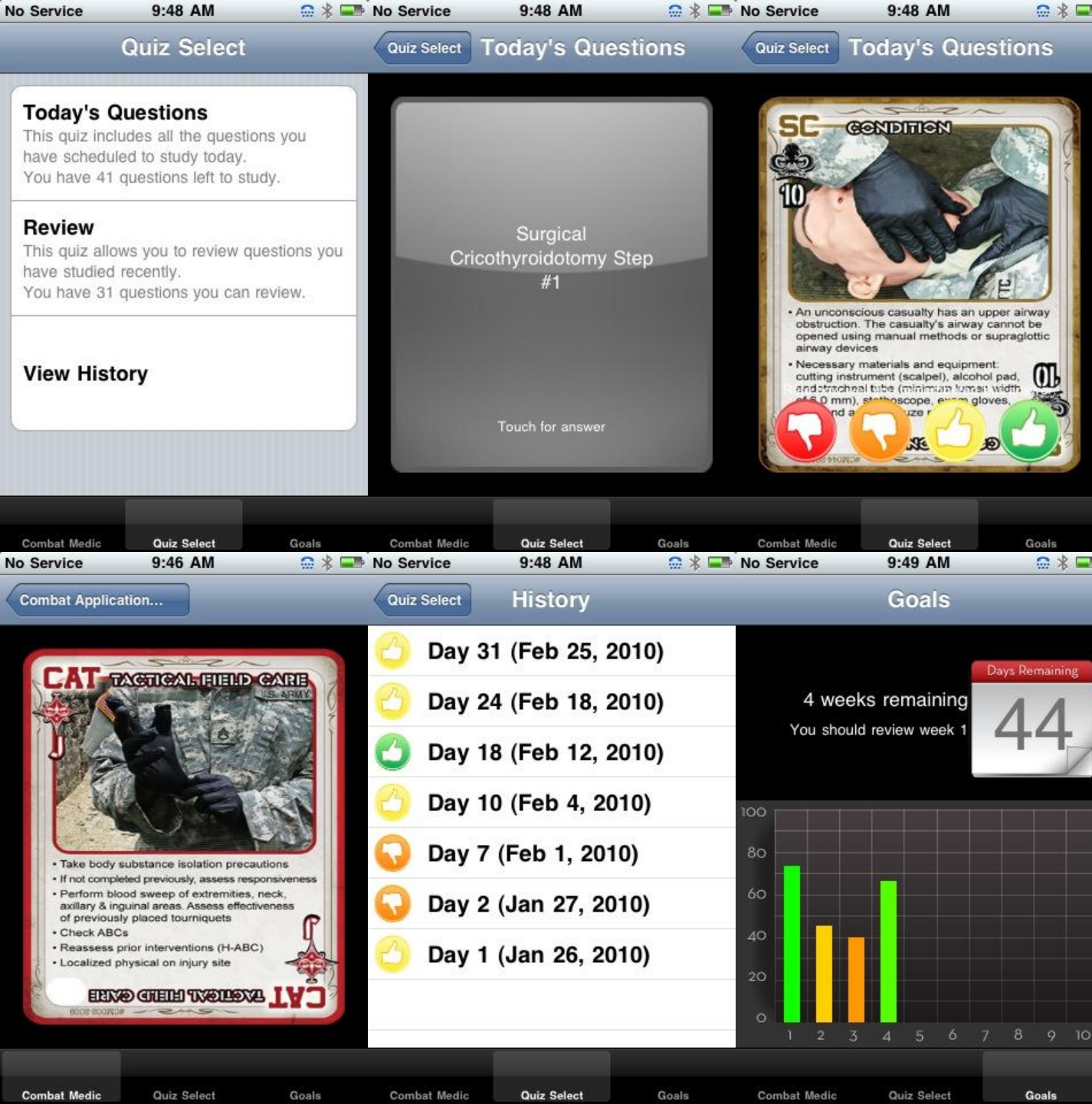
Combat Medic Card Games

- Research project on card games to reinforce learning for life saving procedures
- Four customized versions of standard games
 - Solitaire (Cruel)
 - Rummy
 - **King's Corners**
 - Nertz
- Cards also usable as flash cards or regular deck
- Flexible framework & ease of production means easy expansion to other audiences



Combat Medic Card Games





Mobile Interval Spacing Algorithm

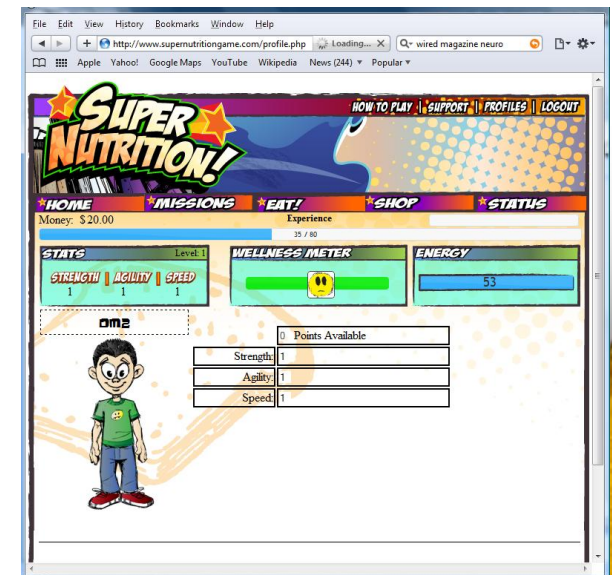
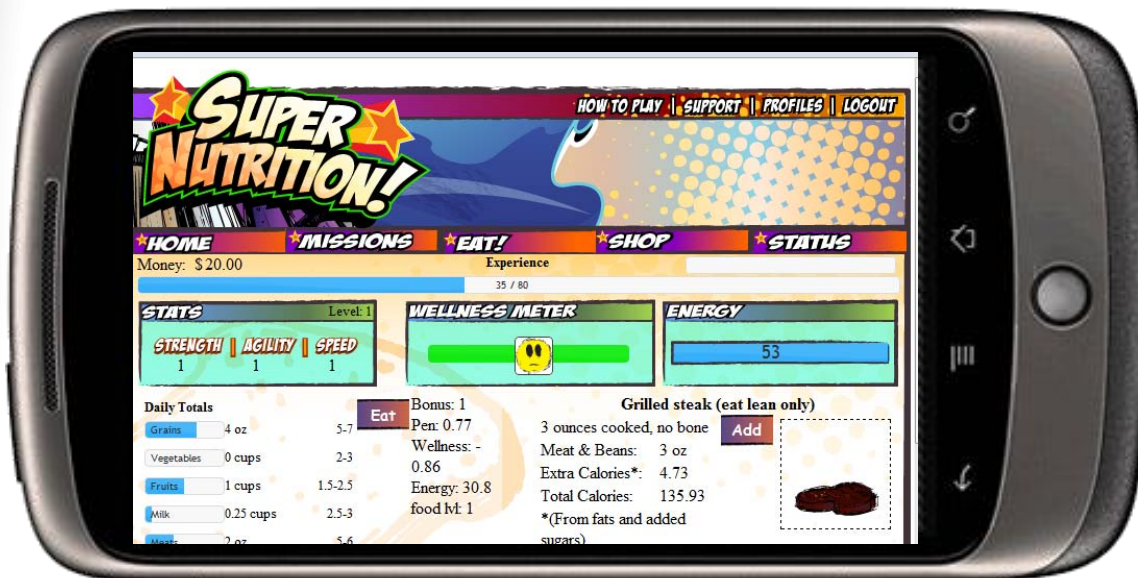




COMBAT HUNTER

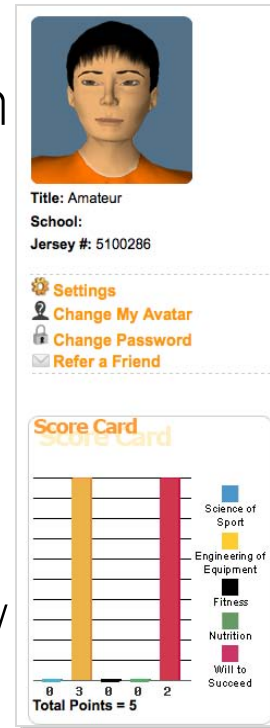


- Facebook-style mobile social game
 - Multiplayer
 - Multiplatform
- Teaches the new FDA food pyramid through eating for energy to perform missions that can get you enrolled in Superhero school
 - Target 9-12 yr olds



Mobile MySportsPulse

- Science and Math education combined with sports through mobile learning
- Can be done through SMS, IVR, email or web browser
 - Voice recording or video from sports celebrities
 - Answer sent back and scored by automated system
 - **Timed intervals that have been proven to produce learning outcomes and reinforcement**



Title: Amateur
School:
Jersey #: 5100286

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Score Card

Category	Score
Science of Sport	3
Engineering of Equipment	0
Fitness	0
Nutrition	0
Will to Succeed	2

Total Points = 5



Username: Password: Remember me: Login

Home | General Information | Contact Us | FAQs | Search: browse

My Sports Pulse

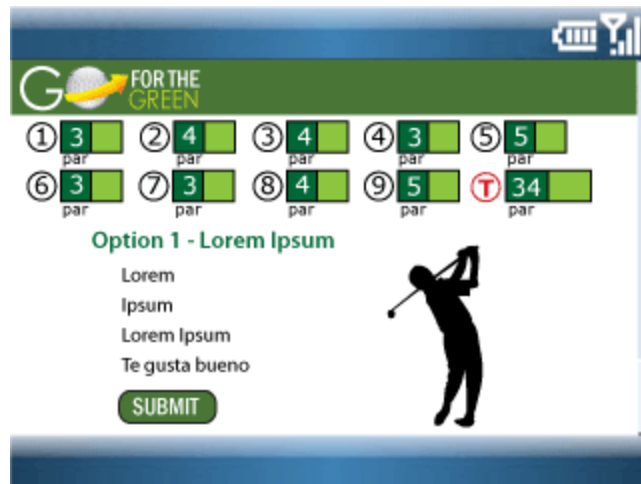
The Challenge
There is a documented worldwide shortage of science, technology, engineering and mathematics (STEM) students in undergraduate and graduate programs who can meet and fulfill the standards of mathematics courses.

The Concept
Innovative integration of three domains:
 - STEM Education to improve students' interest and future technical entrepreneurship opportunities;
 - Sports Theme to expand audience, promote interest and provide extrinsic motivation; and
 - Mobile Technology for delivery to a young, broad audience, reaching millions internationally.

Contributing Organizations
Founded in 1962 as a research unit of the University of Central Florida, IST provides a wide range of research and information services for the modeling, simulation and training community. IST also has a long history of providing the military with technology for simulating work processes, particularly in high stress situations, along with other integrated learning technologies. Complementing this expertise is the university's award-winning Technology Incubator (UCFTI). [Read more...](#)

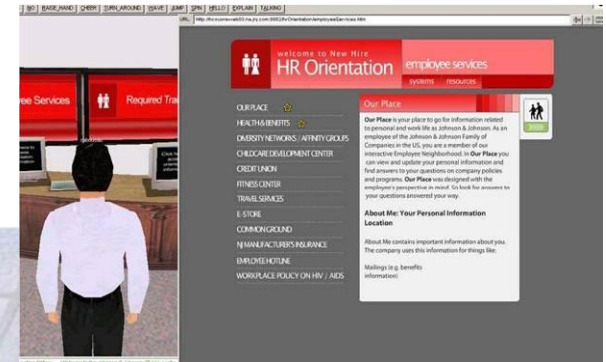
Golf-themed Mobile Sales Game

- Learning game for sales people with a 9 step process themed around golf.



Runs from the same code on Windows Mobile, iPhone, Blackberry, Symbian, Palm, etc.

Johnson & Johnson PRD 3D University



J&J University Mobile Initiatives

- Blackberry pilot- with RIM's newly acquired Digital Chalk division
 - Blackberries issued to Senior Directors and above
 - Variety of offerings in School of Professional and Personal Development

Other pilots in review on standard mobile phones using messaging (email, text messaging and voice messaging) with UCF tools



Online and Mobile Phase II- Card Sim

- The online Flash component of the card game simulation will allow players from various DAU sites to participate in a real-time multiplayer game. Each player will have a laptop and control his or her cards through the Flash user-interface. Communication between sites for player interaction and instructor moderation might be accomplished through VoIP or by utilizing video conferencing equipment in a high-tech simulation facility.

DAU

Joint Unmanned Robotic Device (JURD) - Environmental Risk

Scenario

The program office could transfer the risk to the users and let them determine how to ensure the system will meet compliance requirements after delivery. They may be able to negotiate with the regulators or perform trade-offs with other emissions generated at their installations. However, a threshold requirement is a threshold requirement and not for the program office to debate the user's requirement. Moreover, there is a risk to the program that the current threshold emission requirement will not be acceptable by the time the system is fielded.

The best way to handle this risk is to try to control it. The ACTD project office might be able offer some assistance on the new technology with the development of their unmanned robotic system, then incorporate the new propulsion technology prior to low rate initial production.

Solutions:

Option 1: Hold a meeting with the PM and major stakeholders to discuss that there is likely to be a failure to meet a threshold requirement and to plan for a program reevaluation.

Option 2: Coordinate with the user to clarify the requirement. Once clarified, reassess the risk in terms of probability and consequence.

Option 3: Approach the ACTD program to integrate the JURD system performance requirements into their existing program.

Current Role: Program Management Level: ★★ ★

Jeremy: This is what Jeremy's text might look when he is talking to other players on the screen. It will look different to him to know it's his.

David: This is what David's text will look like when he is typing a message to another person.

Danielle: This is what Danielle's text might look.

This is what text will look like. **SEND**

Business, Cost Estimating, and Financial Planning ★ ★

System Planning, Research, Development and Engineering ★

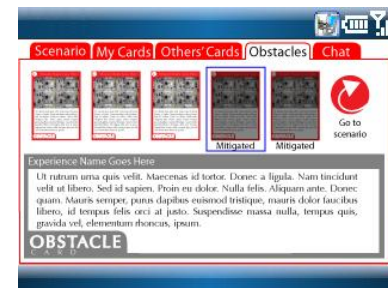
EXPERIENCE 1
Your experience with Planning, Programming, Budget, and Execution (PPBE) allows you to mitigate planning, scheduling, programming, and execution process problems.
Value: Experience + 1

ADDITIONAL RESOURCE 1
You have extra support from an Integrated Product Team (IPT) to help you identify and solve problems.
Value: Additional Resources + 1

ADDITIONAL RESOURCE 1
Source selection gives you extra resources and capabilities.
Value: Additional Resources + 1

SPECIALTY 1
You have had training and experience in contract law, a specialty you have been able to use in your current role to your team's advantage.
Value: Specialty + 1

OBSTACLE 1
Your extensive experience in contract law allows you to bring your knowledge that is helpful to your team.
Value: Experience + 1



Virtual Worlds Integration

Second Life

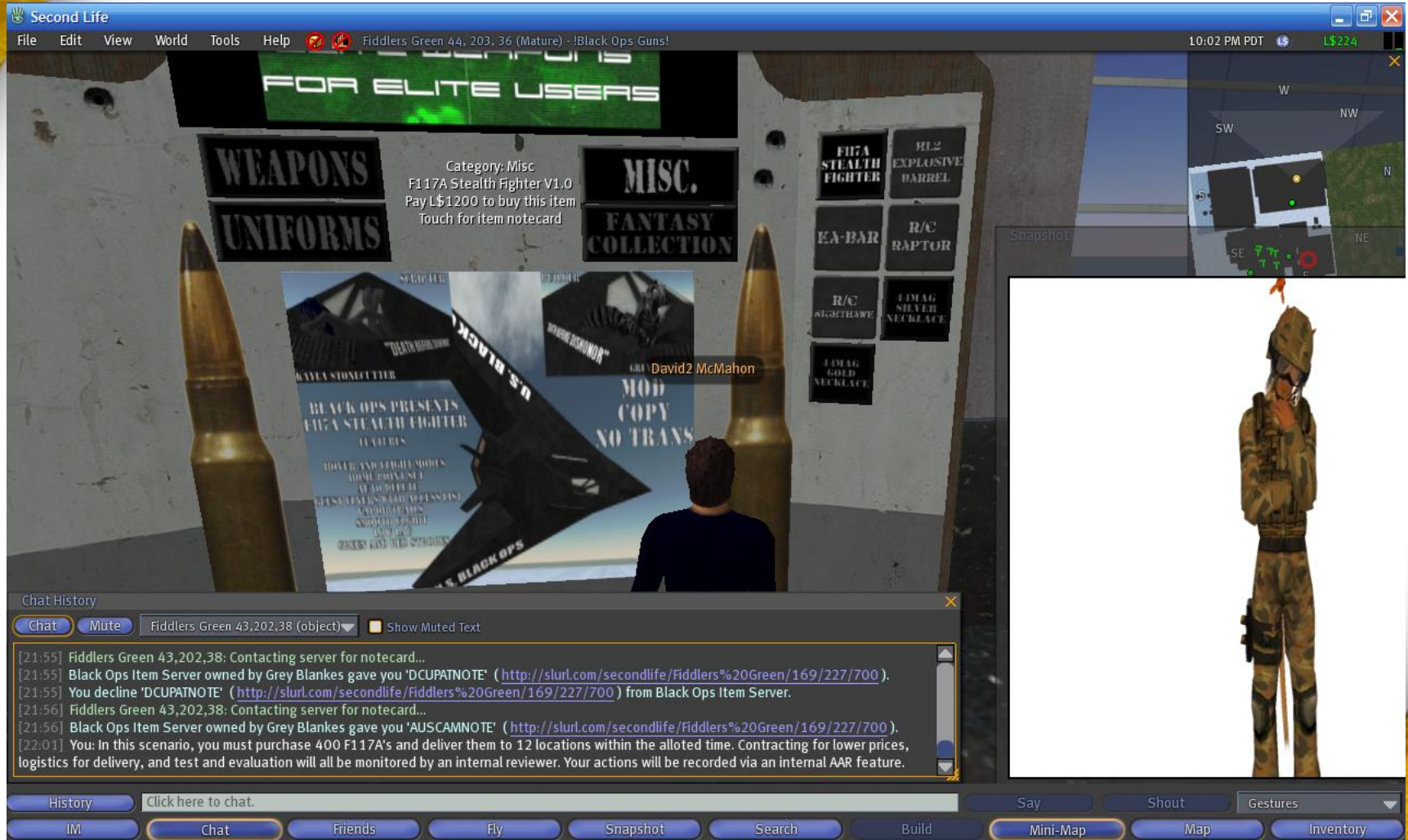
File Edit View World Tools Help Fiddlers Green 98, 186, 48 (Mature) - !Black Ops Guns! 9:48 PM PDT L\$224

David2 McMahon

You: CASSANDRA – Card-Based Version (UCF IST) The DAU card game simulation allows up to six players to navigate their way through the defense acquisition process, encountering and overcoming obstacles along the way. Players will be arranged around a table with the card game in the center. Each player will take on a role (Program Manager; Business, Cost Estimating, and Financial Planning; Contracting; Test and Evaluation; Lifecycle Logistics; Systems Planning, Research, Development, and Engineering). The role card determines what kinds of actions each player will be able to take during gameplay. For games with less than six players, one or more members of the team will take on an additional role. The instructor will read aloud one of the scenario cards. Once the team is aware of the problem, they will decide on a possible solution, find out what they need to get there, and work towards that goal. They will be dealt five cards each. If they receive a red obstacle card, they will move the card to the center of t

History IM Chat Friends Stop Flying Snapshot Search Build Mini-Map Map Inventory Say Shout Gestures

Integrating Web and Mobile Scenarios into Virtual Worlds



DAU Telepresence Study

- Comparison of the effectiveness and engagement of live roleplay and Telepresence-enabled simulations



Contingency Contracting Simulation

- Training simulation for DAU
- Uses elements of role playing and pervasive or Alternate Reality Gaming
 - Uses common technologies: email, phone calls, SMS
 - Students interact with in-simulation characters
- To accommodate small, asynchronous groups most elements are pre-produced and delivered through automated system

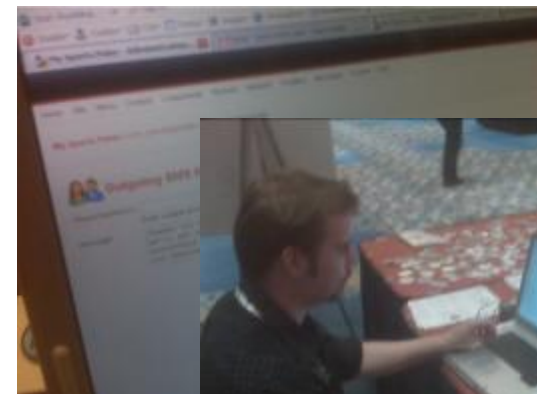


MENTORS IN IRAQ



ARG

- Conference-based ARG to teach leadership, compliance, and workforce diversity issues
- Live and virtual experience

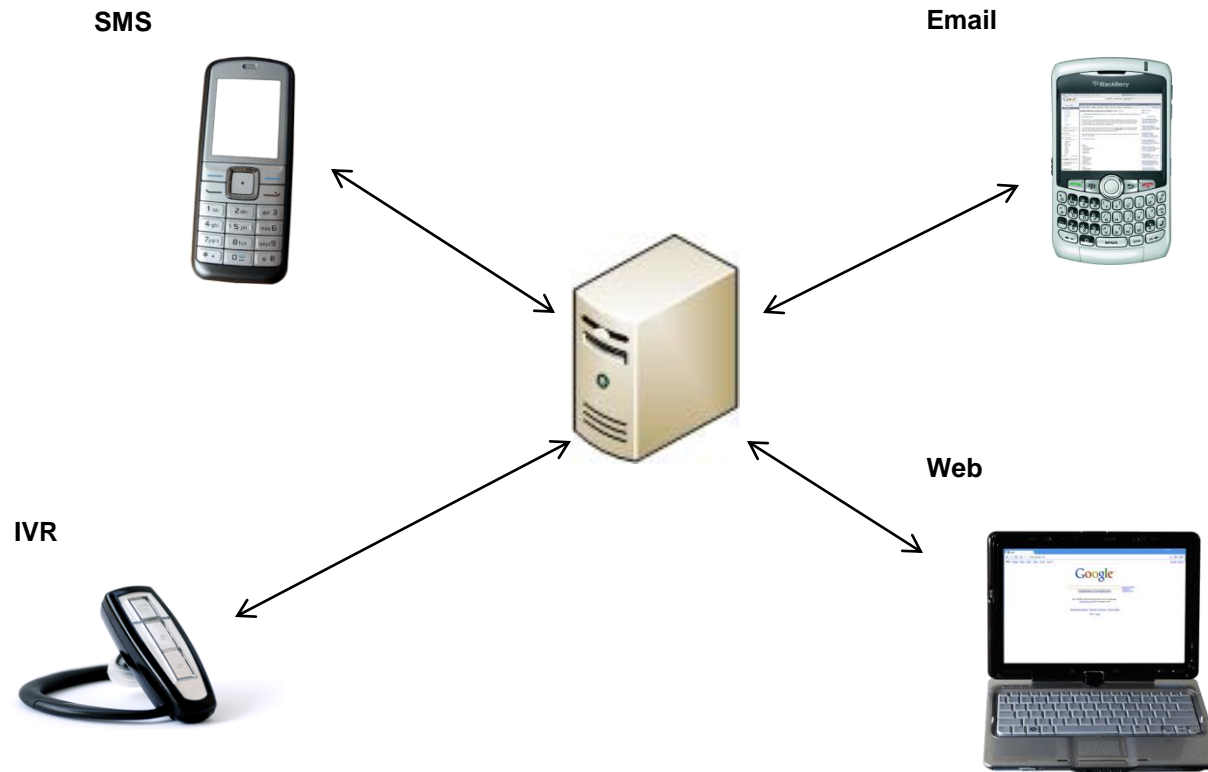




Google Leadership Game

- Interactive experience using Moving Knowledge for leadership, new product launch and presentation skills
- **Represents a “gLearning” mashup with 7-8 Google tools- YouTube, Gmail, GoogleDocs, Moderator, GoogleTalk, etc.**
- 1 Month curriculum created and produced in 3 weeks. 1 year program in 6 weeks. Time and Cost Efficient
- demo@movingknowledge.com or text to 3212307958 keyword DEMO

Moving Knowledge @ Google



The Moving Knowledge Engine is able to interface with several modes of communication including Text Messages, Email, Interactive Voice Response, and the Internet giving users the ability to access content from virtually anywhere.

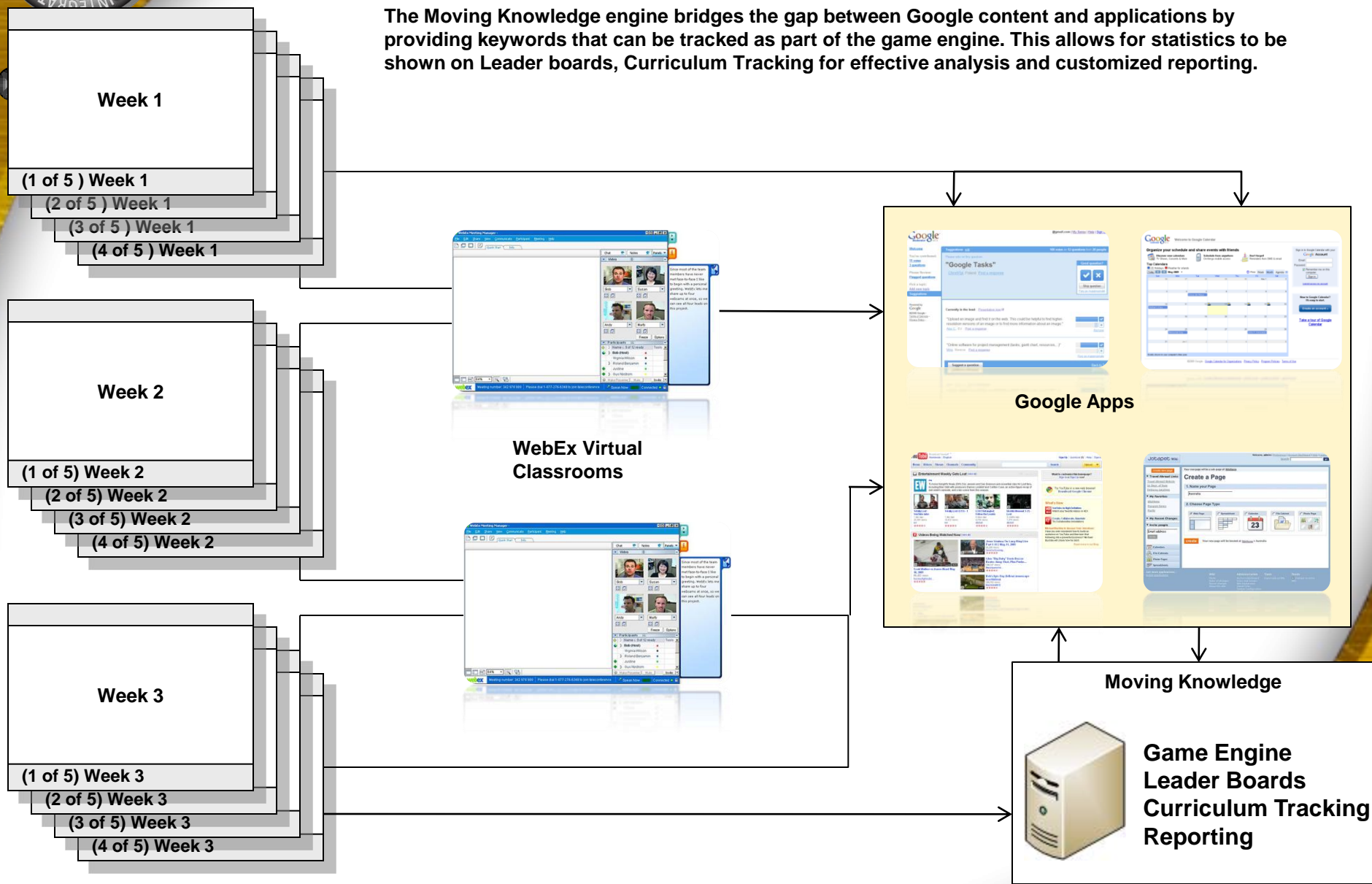
Moving Knowledge

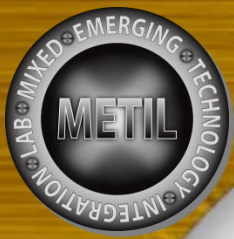


**Multimodal
Delivery and
Interaction**

Curriculum for gLearning @ Google

The Moving Knowledge engine bridges the gap between Google content and applications by providing keywords that can be tracked as part of the game engine. This allows for statistics to be shown on Leader boards, Curriculum Tracking for effective analysis and customized reporting.





Moving Knowledge

- A METIL Lab spinoff and licensee small business to easily commercialize and serve commercial industry
- Operationalize key innovations, particularly mobile technology and games for learning
- Flexibility of contracting through Moving Knowledge Small Business or UCF University Research Partnering Agreement



Allogy: Lessons Learned

- Our students consider this their best learning experience
- One semester is tight for a development project
 - Multi-Semester projects advisable
- Works best with small (5-7) teams of gifted and motivated students
- Blended teams from freshman through senior years provide an ideal mix for mentorship and leadership
- Practical application an essential motivator



Video nano / m4v



com3D

Online / Flash

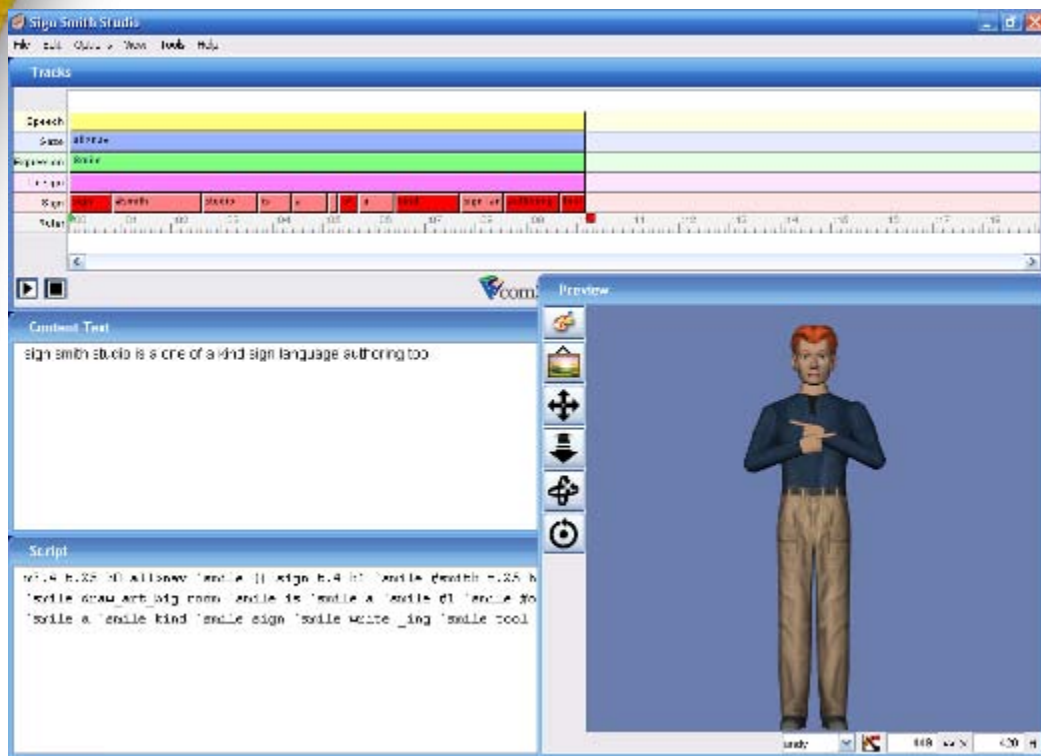


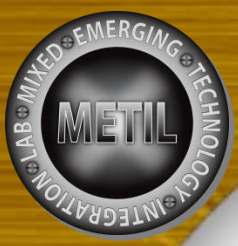
Instructor: A customer has just approached your workstation. Please select the appropriate greeting from the choices below.

- ☐ Yes?
- ☐ Do you need something?
- ☐ Good morning! How may I help you?

Author Once, Use Everywhere

Sign Smith STUDIO



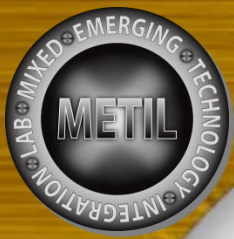


Android Club and Mobile Monday Kickoff



Future Goals and Needs

- Continued integration of emerging technologies that go beyond Web 2.0 (mobile, VW, Games/Sims, Collab/KM) to advanced concepts and tools in augmented cognition, telepresence, and other disciplines
- Partners with similar vision and big goals to achieve significant results
 - Interesting projects that are big enough to have impact
 - International partnerships that meet the broad goals of UCF
- Resource strategies for people, funding, and tools that can create a sustainable, large innovation factory
 - Spin-off multiple commercial entities and help launch/fund startup activities for students, faculty and our staff



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